

CHAPTER 11

SPILL CONTROL PLAN

The requirements for a Contaminating or Toxic Substance Spill Control Plan (Spill Control Plan) are not specifically found in the 9B regulations. The NPS combined informational requirements¹ and operating standards² from the 9B regulations to develop a format for a Spill Control Plan.

Through the Spill Control Plan, the NPS asks operators to answer the following questions:

1. What substances or conditions are present on the location or may be encountered during operations that pose risks to human health and safety or the environment?
2. How does the operator plan to manage such substances or conditions to minimize the risks to human health and safety and the environment?
3. What actions will the operator take should a spill event occur?

SPILL CONTROL PLAN ELEMENTS

The Spill Control Plan should be a separate section in the plan of operations and follow the format described below. An example Spill Control Plan is included at the end of this chapter.

Sections A and B should answer the first question: What substances or conditions are present on location or may be encountered during operations that pose risks to human health and safety or the environment?

SECTION A – IDENTIFICATION OF CONTAMINATING OR TOXIC SUBSTANCES USED ON SITE OR EXPECTED TO BE ENCOUNTERED DURING OPERATIONS

Identify substances on the location or expected to be encountered during operations, which if released, pose a threat to human health and safety or the surrounding environment.

This information is best presented with a table listing all the fuels, chemicals, materials, and additives to be used or encountered during the conduct of operations. The table should list the product name, its hazardous content, and its hazardous effect (e.g., flammable, corrosive, irritant, etc.). Most materials and chemicals have Material Safety Data Sheets (MSDS) that can be provided by the suppliers. The MSDS's will identify the product's hazardous ingredients, physical/chemical properties, fire and explosion hazards, reactivity, health effects and first aid procedures, environmental concerns, and necessary protective control measures. The operator should attach a MSDS for each item listed in the table. Table 10-1 in this chapter is an example of the type of information that should be included in the Spill Control Plan.

¹ See 36 CFR § 9.36(a)(10)(vi), § 9.36(a)(14), § 9.36(d)

² See 36 CFR § 9.39(a)(1)(ii) & (2)(iii), § 9.41(e) & (f), § 9.43, § 9.44, § 9.45

SECTION B – IDENTIFICATION OF ABNORMAL PRESSURE, TEMPERATURE, OR OTHER HAZARDOUS CONDITIONS ON SITE OR EXPECTED TO BE ENCOUNTERED DURING OPERATIONS

Identify pressure or temperature conditions that will require special precautions to ensure protection of human health and safety and the environment.

This section normally applies to drilling operations, but may also be a factor for naturally flowing wells, heated process systems, or gas compression operations.

For drilling operations, the operator would identify any overpressured or lost circulation zones that may be encountered while drilling. The operator would then describe measures that will be taken to control formation pressure or lost circulation.

The operator should also note any production processes that involve very high pressures or temperatures.

SECTION C – MANAGEMENT MEASURES TO MINIMIZE THE RISKS TO HUMAN HEALTH AND SAFETY AND THE ENVIRONMENT

Section C should answer the second question: How does the operator plan to manage such substances or conditions to minimize the risks to human health and safety and the environment?

The operator should describe:

- Prediction of the direction, rate of flow, and total quantity of oil, brine, or drilling mud which could be discharged as a result of each major type of failure (e.g. tank failure, flowline failure, loss of well control),
- Design and use of secondary containment (berms, dikes, ring levees, liners, drip pans, curbing, etc.),
- Sumps and collection systems,
- Facility drainage and practices for inspecting, and then discharging, recycling, or disposing of stormwater,
- Frequency of flowline, tank, equipment, and general site inspections by personnel,
- Chemicals and other additives handling and storage practices,
- Fuel and/or crude oil storage and transfer operations,
- Any automatic sensing, alarm, or automatic control systems (including automatic surface or subsurface shut-in valves for flowing wells),
- Personnel training and spill prevention procedures, and
- Site security (e.g., fencing, gates, security guards or other personnel).

In Section C, the operator also describes those good practices for managing wastes.

Section 9.45 of the 9B regulations, Handling of Wastes provides the standard for handling wastes:

“Oilfield brine, and all other waste and contaminating substances must be kept in the smallest practicable area, must be confined so as to prevent escape as a result of percolation, rain, high water or other causes, and such wastes must be stored and disposed of or removed from the area as quickly as practicable in such a manner as to prevent contamination, pollution, damage or injury to the lands, water (surface and subsurface), facilities, cultural resources, wildlife, and vegetation or visitors of the unit.”

Although § 9.45 was written to apply to waste, the same standards apply to handling oil, drilling muds and cuttings, produced fluids, and chemicals, or other substances described in Section A.

The example Spill Control Plan illustrated below demonstrates a good way to present this information.

Readily available emergency and spill response equipment reduces the risks to human health and safety and the environment. This section should include a description of personnel, equipment, and materials needed to quickly control and remove spills. The response equipment and materials should be categorized by what will be maintained;

- At the operation's site,
- On the pumper's (or other personnel's) vehicle, and
- Off-site.

The NPS does not require emergency response equipment to be maintained on location if the threat of a spill is low, secondary containment is adequate, the pumper's vehicle carries a spill kit capable of handling small incidents, and the emergency response times for larger incidents are reasonable.

The steps that an operator might take to minimize risks of high pressure or temperature include use of properly designed equipment and good operating / maintenance practices, but also use of site security measures such as warning signs, fences, and locked gates. Fencing is required where wells and associated facilities are in areas frequented by visitors or wildlife (36 CFR § 9.41(e)).

An example spill control plan is included at the end of this chapter. Tables 4.1 and 4.2 list operating stipulations and recommended mitigation measures that can also be used to design operations that adequately consider spill prevention and control.

SECTION D – CONTINGENCY ACTIONS

Section D answers the last question: What actions will the operator take should an undesirable event occur? In other words, what is the operator's contingency plan for spills, releases, fires, or other undesirable events?

In this section the operator outlines the contingency actions that would be taken in the event of a release of contaminating or toxic substances. Although contingency actions vary based on individual company policies, they should all outline procedures to:

1. Control the source,
2. Secure the site (if necessary),

3. Contain the release,
4. Clean up the release of contaminating or toxic substances, and
5. Report the incident.

Note: Even though the verbal report of a spill event is listed as number 5, the report should be made to the superintendent at the earliest practical time.

Spill Reporting

State and federal regulations require formal notification for certain types of spill or release events. This section of the Spill Control Plan should list the reporting requirements that apply to the facilities covered in the plan of operations. In addition to the reporting requirements of other federal, state, or local authorities, operators in National Parks are required to report spill incidents to the park superintendent or his designated official. The following statement needs to be included in this section of the plan:

"For all releases to the ground of contaminating or toxic substances, [operator] will promptly report the following initial information to [park superintendent]: the time the spill was discovered; the type of product released; the location; estimated spill volume; cause of spill; area covered; estimated rate of release if spill is ongoing; direction of oil movement; description of contaminated area; proximity to surface waters, roads, or trails; weather conditions; what steps are being taken to remedy the situation; and initial response equipment required. For releases in excess of five barrels in the aggregate, [operator] will provide a written report to [park superintendent] within 10 working days of the incident. In addition to the information reported in the initial notification, the written report will include steps that will be or have been taken to prevent recurrence of the incident."

Emergency Response

Emergency response to spill events will focus the safety of personnel and the public as a first priority and then spill control and containment of the release. Once the spill is controlled and the safety of personnel and the public is ensured, the emergency response shifts to containment and minimization of environmental impacts. Cleanup and repair work are typically performed as projects and not as an emergency response. The NPS's role during the initial emergency phases is to receive notification from the operator, evaluate information, and lend appropriate assistance.

When the spill response shifts to containment, the NPS role changes to one of active review and approval. In the case of a spill, the NPS's intent is to minimize the area affected by the release. At the same time, containment efforts should not cause more environmental damage than the spill itself. Therefore, immediate involvement of the NPS in the containment decision-making process is critical if the spilled contaminants have or threaten to move beyond the operation's area.

To clarify the NPS role in emergency response actions, the operator should include the following statement in the contingency plan:

"[Operator] will consult with the [park superintendent] and obtain the [park superintendent's] consent prior to performing ground and vegetative disturbing activities outside the area of operations."

Clean-up and Removal of Contaminating or Toxic Substances

For spills that are contained within the approved area of operations, the NPS does not expect cleanup to meet the same standards that will eventually apply to reclamation of the site. 36 CFR § 9.45, Handling of Waste sets the standard for cleanup and removal of the spills within the approved area of operations.

The cleanup standards based on Section 9.45, Handling of Waste are summarized below:

- The spilled materials must be kept in the smallest practical area. This means mixing of contaminated soils with clean soils to achieve lower contaminant concentrations is not an option.
- The spilled materials must be confined to prevent migration of contaminants via percolation, rain, high water, or other means.
- The spilled materials (as well as soils or water contaminated by them) that cannot be recycled to the operations processes are a waste and must be stored and disposed of or removed from the area as quickly as practicable.
- The cleanup and removal of contaminants may not cause additional damage to park resources or threaten human health and safety.

A well-developed and implemented spill control strategy will ease the cleanup of the leaks, spills, and other releases that do occur. Spills will usually be controlled by the secondary containment used in operations. Again, refer to the example Spill Control Plan at the end of this chapter for an understanding of how to document the procedures for cleanup and removal of contaminating or toxic substances.

An operator may use bioremediation or other on site clean-up options, after consultation and agreement with the park superintendent. The superintendent would only allow onsite remediation efforts to disturb additional surface area if there was a clear benefit to park resources over other alternatives. In other words, use of additional surface area to remediate spills onsite is not likely.

Should a spill reach beyond the operator's approved area of operations, the operator will need to take actions to restore the disturbed area to the natural conditions and processes that existed before the spill.

Reclamation standards require removing or neutralizing any contaminating substances (36 CFR § 9.39(a)(2)(iii)). Neutralization of contamination means that contaminant concentrations will be reduced in soils to a condition that will not adversely affect, injure, or damage federally-owned or controlled lands, waters, and other resources, provides for the safe movement of native wildlife, and which does not jeopardize visitor safety or public use of the park (36 CFR § 9.39(b)). If warranted, the operator will need to test soils to verify that contaminating substances have been removed or neutralized.

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLANS

If determined to be adequate by the superintendent, a Spill Prevention Control and Countermeasure Plan, approved under 40 CFR Part 112, may be used to satisfy most of the Spill Control Plan requirements.

The SPCC addresses facilities where oil spills would pollute or threaten to pollute waters of the United States. Many facilities in parks will meet the criteria for having to have an approved SPCC plan. If this is the case, a properly prepared SPCC plan will satisfy most of the Contaminating or Toxic Substance Spill Control Plan requirements. In addition to the SPCC plan the operator still needs to provide the following:

1. The listing of contaminating or toxic substances along with their MSDS's as described in Section A above.
2. The statements supporting NPS spill reporting requirements as follows:

"For all releases to the ground of contaminating or toxic substances, [operator] will promptly report the following initial information to [park superintendent]: the time the spill was discovered; the type of product released; the location; estimated spill volume; cause of spill; area covered; estimated rate of release if spill is ongoing; direction of oil movement; description of contaminated area; proximity to surface waters, roads, or trails; weather conditions; what steps are being taken to remedy the situation; and initial response equipment required. For releases in excess of five barrels in the aggregate, [operator] will provide a written report to [park superintendent] within 10 working days of the incident. In addition to the information reported in the initial notification, the written report will include steps that will be or have been taken to prevent recurrence of the incident."

SAMPLE SPILL CONTROL PLAN

The following example “Contaminating or Toxic Substance Spill Control Plan” (Spill Control Plan) can be used as a template by an operator when preparing a Spill Control Plan for a proposed plan of operations.

In this example, Tidy Oil Company has just acquired some oil and gas operations inside a national park. The operations consist of two oil wells on pumpjacks, and a tank battery that includes separators, two 1000-barrel oil tanks, and one 1000-barrel saltwater tank. The oil and brine is trucked and gas that is not used as lease fuel is flared. Tidy also plans to drill an additional development well, which it expects to be a flowing oil and gas well with its own separation and storage facility.

In the attached Spill Control Plan, the NPS includes **NOTES** (shown in **bold**) to help explain the plan content. The **NOTES** would not be included in the actual spill control plan.

SECTION A – IDENTIFICATION OF CONTAMINATING OR TOXIC SUBSTANCES USED ON SITE OR EXPECTED TO BE ENCOUNTERED DURING OPERATIONS

During the operations of producing oil and gas from the existing and drilling proposed wells, the substances listed in Table 10-1 are used or expected to be encountered. Table 10-1 lists each substance by generic product name, its use in operations, its hazardous content, and its hazardous effect. A copy of the Material Safety Data Sheet (MSDS) for each item listed in Table 10-1 is also attached. The MSDS lists proper safety procedures and protective devices for using each product as well as first aid information in the event of exposure.

SECTION B – IDENTIFICATION OF ABNORMAL PRESSURE, TEMPERATURE, OR OTHER HAZARDOUS CONDITIONS ON SITE OR EXPECTED TO BE ENCOUNTERED DURING OPERATIONS

Tidy Oil does not expect any abnormal pressures, temperatures, or other hazardous conditions that require any special precautions during the course of drilling and production operations.

Tidy’s existing wells are no longer capable of flowing naturally. The proposed Tidy Well No. 3 is expected to flow naturally at first, but will eventually require artificial lift. Bottomhole pressures ranging from 1500 to 2200 psi and a bottomhole temperature of 130° F are normal for a partially depleted reservoir at 5000 feet depth. Surface operating pressures are expected to be less than 500 psi. Gas not used as lease fuels is compressed to 300 psi for delivery to the AAA Pipeline.

Hydrogen sulfide gas, overpressured zones, or extreme lost circulation zones are not known to exist in the area and are not expected to be encountered while drilling the Tidy No. 3 well.

SECTION C – MANAGEMENT MEASURES TO MINIMIZE THE RISKS TO HUMAN HEALTH AND SAFETY AND THE ENVIRONMENT

Drilling Operations

Tidy Oil has a number of strategies to prevent and contain contaminating substance spills during drilling operations. Site construction (as described in detail in Section V., Description of Operations) includes construction of a ditch and ring levee around the entire drill site. The area

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underneath the drilling rig, pumps, jetting pits, mixing tanks, pipe racks, compressors, generator house, BOP accumulator, tool houses, and fuel and chemical storage is lined with 18 mil impervious PVC liner. After setting the conductor casing, the cellar will be sealed on the bottom with cement and around the sides with epoxy and corrugated steel.

Any rainwater, rig wash, and spilled liquids within the lined area will flow to the cellar where they can be collected for recycling into the mud system or disposal. Rainwater that collects outside the lined area will be visually inspected for sheen and tested for conductivity prior to supervised discharge. Any contaminated stormwater will be recycled into the mud system or vacuumed up for disposal.

Leak sources on the drill site include mud tanks, diesel fuel tank, chemical and lubricating oil drums, piping, machinery, hydraulic systems, mud additives, and the well itself. All of these items are maintained within a lined area as previously described. Other than a complete loss of well control, the largest spill potential would be the rupture of a mud storage tank (300 barrels). The capacity of the diesel storage tank is 180 barrels. The lined area could contain a spill of 1200 barrels. Any spills within the lined area would be contained and picked up.

The possibility of a well blowout is extremely small. Open flow potentials of wells in the field are less than 1000 barrels of oil per day. The area enclosed by the ditch and ring levee could hold up to 18,000 barrels of fluid. Tidy would respond as quickly as possible to control a blowout. A spill that escaped the drilling location would move to the northeast towards Fish Creek, which is about 3000 feet from the drill site. Should it become necessary, Tidy would consult with the superintendent to build berms to prevent a catastrophic spill from reaching the creek. A topographic map is included in Section II of the Plan of Operations.

Other preventive practices to be used during drilling include:

- Employees and contractors will be properly trained to reduce the number of human errors that often cause spills.
- Visual inspection during rig-up to assure the satisfactory condition of storage tanks, piping, fittings, and other rig equipment that normally hold contaminating substances such as drilling mud, oil, fuel, lubricating oil, hydraulic fluid, etc.
- During operations, employees and contractors will be observant for signs of spills or leakage and the need for equipment maintenance.
- The drill rig is manned by personnel trained in well control.
- Blowout preventers will be installed after setting the surface casing. All blowout prevention equipment is visually inspected daily. The blind and pipe rams are function tested daily or as operations permit. The rams and annular preventer are pressure tested weekly.
- Equipment oil and coolant changes will be performed prior to mobilizing to location rather than on-site.
- Less toxic substances will be substituted for more toxic substance where practical.
- Secondary containment areas will be inspected daily for integrity.
- Placement of temporary liners under service equipment such as logging units, cementing equipment, etc.

- A security guard will be posted where the well access road leaves the public park road to keep visitors from entering the location and to direct rig traffic on the single lane road.

The following cleanup equipment will be available at the drill site for immediate use by on-site personnel in response to small spills, and for initial spill containment and cleanup efforts in response to larger spills that may require additional contractor assistance:

- Two 100-foot containment booms,
- 10 bales absorbent pads,
- 10 bales absorbent sweep,
- One 2-inch pump with hose,
- One case of disposal bags, and
- Assortment of shovels, rakes, etc.

Also, a front-end loader is kept on location during drilling operations and is available if needed to contain a spill.

Production Operations

Tidy Oil has a number of strategies to prevent and contain contaminating substance spills during production operations.

Leak sources that are common to each of the production sites are the wellheads, flowlines, separation equipment, storage tanks, and the chemical storage and injection systems.

The greatest leak potential would be the rupture of a full 1000-barrel storage tank. All storage tanks have secondary containment within bermed areas. In the event of a tank failure, free liquids would be vacuumed up and returned to storage tanks or disposed of offsite.

Should Tidy Oil No. 3 become a producer, separation and storage facilities will be located within a lined, bermed area as described in Section V, Description of Operations. The berm will be designed to hold 1500 barrels (150% of the largest tank). If Tidy No. 3 is completed as a flowing well, the wellhead will include an automatic shutoff wing valve. The valve will automatically close off production from the well if there is a loss of flowline pressure.

Tidy Oil No. 2 and 3 are no longer capable of natural flow. Each well produces about 50 barrels of oil and 200 barrels of salt water per day on pump jack. The Tidy No. 2 and 3 tanks are also within a bermed area that has a compacted clay bottom. Outside the bermed areas, the largest conceivable spill from a well would be 50 barrels of oil and 200 barrels of saltwater resulting from a flowline break that goes undetected for a 24-hour period. The ditch and ring levee configuration around each well is capable of holding at least one week's production.

Rainwater that collects in bermed areas or in the drip pans will be inspected for sheen and tested for conductivity prior to discharge. All stormwater discharges are supervised and recorded. Any stormwater that is found to be contaminated will be pumped into the brine storage tank and ultimately disposed of at an approved facility outside of the park.

Other preventive practices to be used during drilling include:

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- Secondary containment under chemical bulk storage containers is provided by drip pans. The chemical pumps are also located beneath the chemical tank on the drip pans.
- Loading connections for the oil and brine tanks are located within the bermed areas. Drip basins are provided under each connection point. Any oil or brine leaked into the drip basin during loading operation is removed promptly.
- Training on spill prevention, control, and cleanup measures is conducted for each employee on an annual basis. Employees and contractors are trained on the specifics of this Spill Control Plan.
- The gauger visually inspects the wellhead, piping, valves, tanks, vessels, and chemical injection system on a daily basis for signs of leakage or maintenance needs.
- The gauger also walks the parameter of each location at least weekly or after heavy rains and checks the ditch for accumulation of anything other than rainwater.
- The gauger inspects secondary containment areas for integrity daily.
- Inspect all oil and brine tanks for signs of excessive external corrosion which may lead to tank failure.
- Inspect base of tanks for signs of bottom leaks.
- Flowlines to Tidy No. 1 and No. 2 are walked every 6 months or immediately if there is any evidence of a flowline leak.
- Inspect valves for proper position and locks, if applicable.
- The existing tank battery is fenced with a locked gate, as are the pump jacks at the Tidy No. 1 and 2 wells. If Tidy No. 3 becomes a producer, a fence will be constructed around the well and production facilities.

No emergency response equipment will be kept on location during production operations. The gauger's truck is equipped with one bundle of absorbent pads, two 10-foot absorbent booms, a hand-held fire extinguisher, shovels, rake, and an assortment of hand tools.

SECTION D – CONTINGENCY ACTIONS

In the event of a spill, Tidy Oil's actions will focus on:

1. Controlling the source to prevent further spillage.
2. Securing the site if necessary.
3. Containing the spilled material to the smallest practical area.
4. Cleaning up the spill.
5. Reporting the spill to appropriate agencies.

Spill Reporting

Although reporting the spill is listed as #5 above, Tidy Oil will provide the superintendent a verbal notification of a spill event at the earliest practical time. The company supervisor will determine from onsite personnel the following information and report it to the superintendent:

- The location of the spill and the time it was discovered;
- The type of product released;

- Estimated spill volume and area covered;
- Description of contaminated area;
- Estimated rate of release if spill is ongoing;
- Cause of spill;
- Direction of oil movement;
- Proximity to surface waters, roads, or trails;
- Weather conditions;
- What steps are being taken to remedy the situation; and,
- Initial response equipment required.

For releases in excess of five barrels in the aggregate, Tidy Oil will provide a written report to the superintendent within 10 working days of the incident. In addition to the information reported in the initial notification, the written report will include steps that will be or have been taken to prevent recurrence of the incident.

NOTE: State and federal regulations require formal notification for certain types of spill or release events. The operator should list those agencies here along with the reporting criteria.

Spill Response

The largest reasonable anticipated spill events will be contained within bermed areas or at least contained to the location by the surrounding ditch and ring levee.

In the event a spill is encountered, initial response actions will be aimed at controlling the spill, then containing spilled materials. The gauger or other person(s) onsite will immediately assess the situation and take steps to control the source of the spill (if it can be done safely) by shutting valves, shutting down equipment, or closing in wells as needed.

For small spills, onsite personnel will use equipment on hand to contain the spread of the spill. This would typically involve placing absorbent pads or booms, or by constructing a retaining dike from dirt, boards, synthetic absorbents, hay, straw, etc. Small spills will be picked up immediately with absorbent materials. All contaminated cleanup materials will be stored in impermeable, weatherproof containers until removed from the site. All contaminated materials will be disposed of according to state and federal guidelines.

For larger spills, the company supervisor will be notified of the spill. For drilling operations, the company representative on location will direct response actions to spill events. The company supervisor will direct actions to immediately isolate and shut off source of the material being spilled (if it can be done safely). The supervisor will assess containment needs and call out contract equipment and services as determined necessary. Onsite personnel will use equipment and materials on hand to slow the spread of oil or contaminants until additional equipment/services can reach the site.

In the rare event that spilled materials escape from the location, Tidy Oil will consult with the park superintendent and obtain the superintendent's consent prior to mobilizing equipment that may have lingering impacts to natural resources outside the area of operations. In the event

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immediate response is necessary, approval will be sought via telephone conversation with the superintendent or designated representative.

If a tank truck is involved in a spill incident outside the approved area of operations, but inside the park, Tidy Oil will respond in the same manner as spills within the approved area of operations. The county sheriff's department will be contacted to help control traffic if a tank truck experiences a spill outside of Tidy Oil's area of operations.

At the same time steps are being taken to control and contain the spill, the supervisor will determine what steps may be needed to protect park visitors. Such actions might include locking the gate to the location or blocking the private lease access route from the main park road. Other than the park road, Tidy Oil's operations are not near any areas used by visitors on a regular basis. The only time visitor evacuation of the immediate area might be necessary would be during uncontrolled escape of oil and gas from a well blowout. Tidy Oil would request assistance from the park and local law enforcement as needed to close the park road for all except emergency response personnel.

Cleanup/Removal of Spill

Cleanup and removal of spills within the containment areas will be performed using accepted industry practices. Such practices include the pickup of free liquids with vacuum equipment, application of absorbent booms, materials, and pads; removal of contaminated wellpad material, and replacement with clean wellpad material. In place treatment of contaminated wellpad material could be used as an option to offsite disposal if approved by the superintendent.

Tidy will not mobilize response or cleanup equipment (that could cause damage to park resources) outside the approved area of operations without first obtaining consent of the superintendent.

All contaminated cleanup materials will be stored in impermeable, weatherproof containers and removed from the site as early as practical. All contaminated materials will be disposed of according to state and federal guidelines.

Clean up and removal of spills within Tidy's approved area of operations will meet the standards of 36 CFR § 9.45, Handling of Waste.

Should a spill occur or reach beyond Tidy Oil's approved area of operations, the operator will take actions to restore the disturbed area to the natural conditions and processes that existed before the spill. Cleanup operations will be the same as discussed above for clean up of spills within containment areas except:

1. Tidy Oil will consult with the superintendent and obtain the superintendent's consent prior to mobilizing equipment that may have ongoing impacts to natural resources, and
2. Restoration of the affected area will be performed in consultation with the superintendent and meet the same standards as the Reclamation Plan provided in Section VII of this plan of operations.

Table 10-1. Contaminating and Toxic Substances

DRILLING OPERATIONS				
Product Name	Hazardous Content	Hazardous Effect	Use	MSDS Attached
Gel (Wyoming Bentonite)	Silica (2-6%)	Carcinogen, Irritant	Mud Additive	Yes
Barite	Silica (2-6%)	Carcinogen, Irritant	Mud Weighting	Yes
Caustic Soda	Sodium Hydroxide	Corrosive	Mud Additive	Yes
Poly-Plus (Liquid)	Petroleum Distillates	Irritant, Toxic	Mud Additive	Yes
PolyPac	Cellulose	Irritant	Mud Additive	Yes
Lignite	Silica (3%)	Carcinogen, Irritant	Mud Additive	Yes
Lime	Calcium Hydroxide	Moderately Caustic Irritant	Mud Additive	Yes
Soda Ash	Sodium Carbonate	Irritant	Mud Additive	Yes
Cottonseed Hulls	None	Allergen	Lost Circulation Material	Yes
Cement	Portland Cement	Irritant	Cementing	Yes
Diesel	Diesel	Fire Hazard, Irritant, Toxic	Fuel	Yes
PRODUCTION OPERATIONS				
Product Name	Hazardous Content	Hazardous Effect	Use	MSDS Attached
Natural Gas	Methane, Ethane, etc.	Extreme Fire Hazard, Asphyxiant	Produced from wells	Yes
Crude Oil	Mixture of Paraffins, Naphthenes, and Aromatics	Fire Hazard, Irritant, Toxic	Produced from wells	Yes
Demulsifier	Blend of sulfanates, oxyalkylated phenolic resins, and alkanolamines in aromatic and alcohol solvent	Irritant, toxic	Production stream additive	Yes

